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On the Distal End *of a* Mammalian Humerus *from* Tonbridge (*Hemiomus major*).

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Mr. R. D'A. Anderson, of the Royal Indian Engineering College, has submitted to me the distal end of the right humerus of a mammal for determination. The bone was found in August 1898 by Mr. Grenville Anderson, on the bank of the River Medway near Tonbridge (at a time when the river was running very low), when it was seen projecting from the reconstructed rock. The locality is not far from Messrs. Curtis & Harvey's gunpowder-mills, at a point between a broken and disused lock-basin and an old bridge near the ballast-pit. On visiting the spot I found fragments of flints among the materials which form the river-banks; but although this might support a reference of the specimen to any geological period of subsequent date, there are conditions of mineral structure and osteological character which incline me to believe that the bone has been derived from the Weald Clay.

When the fossil came under my notice, the distal end was broken from the shaft; and the shaft was split, showing the very thin condition of the bone of the shaft, and the hard, sandy, calcareous matter which filled the medullary cavity. Traces of matrix at the distal end show that the specimen has been derived from quartz-sand bound together with limonite, such as might occur in the Hastings Sand, Weald Clay, or Lower Greensand, but the character of this matrix is opposed to the possibility of the specimen being of post-Tertiary age.

The fossil, as preserved, is 4 inches long, and indicates a humerus which may have been 6 inches long when perfect, as large as that of a wolf, but smaller than in a bloodhound.

The shaft of the bone is flattened on the inner side, convex on the outer side, and thus it has a side-to-side compression approximating to half a cylinder, but is somewhat flattened towards the olecranon-pit behind. It is rather obliquely flattened above the condyles in front, making the shaft $\frac{3}{4}$ inch deep on the inner side at the distal end, and rather less on the outer side. The side-to-side measurement is least, as usual, above the distal articulation. Towards the proximal fracture the depth of the shaft, which is augmenting, is $\frac{9}{10}$ inch from front to back, while the side-to-side measurement is $\frac{6}{10}$ inch.

The form of the shaft, flattened on the inner side, precludes any comparison of the animal with Carnivora, and indicates a resemblance to Ungulate types.

The distal articular condyles are set on to the shaft at a forward angle, which shows the animal to be terrestrial. When the shaft is held vertically, the condyles are anterior to it. There is no animal known to me in which this character is developed to the same extent.

The extreme width of the condylar end of the bone is $1\frac{1}{4}$ inch. In narrowness of the condyles the character is somewhat pig-like. The external surface of the condylar end of the bone is convex and

narrow, without an appreciable lateral pit, a character of some interest, since all deer have the outer side of the condyle concave or with a central pit, while the vicuña (*Auchenia*) has a convexity.

When the bone is held vertically and seen from the front, the condyles are oblique; because the outer condyle, which is the larger, then descends lower than the inner condyle. I have not

Hemiomus major, gen. et sp. nov.: distal end of humerus, nat. size.

Anterior aspect. Posterior aspect. Lateral aspect.

noticed this character in any other animal. The condyles are rounded from above downward in front, but almost inappreciable posteriorly. They are divided in front by a moderately deep vertical groove, which suggests the camel; though in that genus the external margins of the condyles are not rounded as in this fossil. The inner condyle is compressed from side to side to a blunt ridge, and this condition contributes to give the condyle a narrow aspect, which is exceptional. The outer condyle is flattened or traversed round its convex middle part by a very slight vertical

depression. Above the condyles in front there is the usual supra-condylar depression, somewhat deep and narrow.

On the posterior aspect the distal end shows its most distinctive features. A long narrow olecranon-pit extends above the small external condylar surface. It is ovate in outline, filled with limonite, is $1\frac{1}{2}$ inch long and fully $\frac{1}{2}$ inch wide in the middle. The inner border is comparatively straight and vertical, and the outer border is convex.

The small external condylar surface below the olecranon-pit is an inconspicuous convexity about $\frac{1}{4}$ inch deep. No part of the inner condyle is visible on the posterior aspect of the bone.

The bone which margins the upper half of the olecranon-pit on the inner side is $\frac{4}{10}$ inch wide, rounded from side to side, but slightly worn. The external margin of the pit, which may also be a little worn, is about half as wide. This character of the relatively external position of the olecranon-pit is seen in the humerus of the tapir, and to some extent among horses.

The lower half of the process which usually borders the olecranon-pit is absent in this fossil; and on the inner side, in its place, is an ovate cartilaginous surface, concave in length, inclined obliquely inward, making an angle of about 45° with the axis of the shaft. There is a similar, but much smaller, atrophy of the corresponding process on the external side, giving rise to a truncated surface, $\frac{1}{2}$ inch deep, forming a narrow crescentic impressed area. This character defines a lateral concavity between the hinder end of the humerus and the anterior border of the olecranon-process of the ulna. This truncation of these parts of the humerus is especially common in antelopes and deer; but, in comparison with known types, recent and fossil, it is much more developed in the Tonbridge fossil animal. There is no Tertiary mammal in which the character is so conspicuous as in existing types. If *Hyracotherium* or *Pliolophus* has the distal end of the bone placed as far forward on the shaft, it entirely wants the truncation of the bone on the lower borders of the olecranon-pit; and there is no other fossil genus with which the specimen has a closer affinity. This consideration is perhaps evidence against the fossil being derived from some Tertiary stratum and accidentally left where it was found, and so far is favourable to the specimen being of Wealden age.

On the whole, the weight of evidence from comparison with other types appears to incline towards reference of the fossil to the Artiodactyla, though there are almost as many points in common with the Perissodactylate humerus. In neither is the hinder part of the distal articulation of the bone comparable to this fossil. I therefore infer that it indicates a new family type. The teeth described by Mr. Smith Woodward and by Mr. Lydekker are indicative of much smaller mammals from the Wealden Beds, and the interest of the specimen now described is chiefly in its size. It may be known as *Hemiomus major*, gen. et sp. nov., in reference to the absence of ossification of the hinder aspect of the distal end of the bone, and as indicative of its size.